

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) Air conditioning system for a motor vehicle, which air conditioning sytem is designed for an air conditioning operating mode and at least one ~~other operating mode in the form of at least one~~ of a heat pump operating mode and a reheat operating mode, said air conditioning system comprising:

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a refrigerant cycle with a compressor, a refrigerant cooler and a supply air/refrigerant heat exchanger, said supply air/refrigerant heat exchanger being disposed in a supply air channel and functioning as an evaporator in an air conditioning operating mode,

a coolant cycle for cooling a heat generating vehicle component,

a refrigerant/coolant heat exchanger, coupling the refrigerant cycle and the coolant cycle so as to transfer heat,

refrigerant flow control valves for controlling mode-dependent flow of the refrigerant so as to be guided in an air conditioning mode from the compressor over the refrigerant cooler to the supply air/refrigerant heat exchanger, and

an internal combustion engine exhaust gas/coolant heat exchanger connected upstream in series to the refrigerant/coolant heat exchanger in the coolant cycle.

2. (Amended) Air conditioning system for a motor vehicle according to claim 1,

wherein said air conditioning system is designed for ~~at least one other operating mode includes~~ a reheat operating mode, in which the refrigerant flow control valves guide refrigerant flow from the compressor at least in part to the refrigerant/coolant heat exchanger, functioning as the condenser/gas cooler in this reheat operating mode, and from there to the supply air/refrigerant heat exchanger, functioning as the evaporator in this reheat operating mode, and

wherein the refrigerant/coolant heat exchanger is connected upstream in series on the coolant side to a supply air/coolant heat exchanger disposed in the supply air channel.

3. (Currently Amended) Air conditioning system according to claim 1, wherein said refrigerant flow control valves include:

a 4 four way valve which is connected with a first connection to the compressor output side, with a second connection ~~directly or indirectly~~ to the compressor inlet side, and with a third connection to the supply air/refrigerant heat exchanger, and

a 3 three way valve ~~which is connected with~~ having a first connection with a fourth connection of the 4 four way valve, ~~with~~ a second connection to the refrigerant cooler, and ~~with~~ a third connection to the refrigerant/coolant heat exchanger.

4. (Original) Air conditioning system according to claim 1, wherein the refrigerant cycle includes a refrigerant high pressure-sided accumulator with an assigned check valve arrangement operably connecting the accumulator to

the supply air/refrigerant heat exchanger, the refrigerant cooler and the refrigerant/coolant heat exchanger.

5. (Original) Air conditioning system according to claim 1, wherein the refrigerant cycle includes:

a refrigerant low pressure-sided accumulator, and

an internal heat exchanger which is arranged on a low pressure side between the accumulator and the compressor and on a high pressure side is connected, on the one hand, to the supply air/refrigerant heat exchanger, and, on the other hand to the refrigerant cooler and the refrigerant/coolant heat exchanger.

6. (Original) Air conditioning system according to claim 1, comprising a supply air conveying unit which exhibits two operating modes with opposite supply air conveying directions at the supply air channel, and

wherein the air conditioning system is designed for carrying out a drying operating mode, in that the supply air conveying unit conveys drying air for drying the supply air/refrigerant heat exchanger in the air conveying direction, reversed to the supply air conveying direction leading into the vehicle interior, past the supply air/refrigerant heat exchanger, whereby the drying mode is activated at least after shutdown of the vehicle in a previous air conditioning or reheat mode.

7. (Original) Air conditioning system according to claim 2,
comprising a supply air conveying unit which exhibits two operating
modes with opposite supply air conveying directions at the supply air channel,
and

wherein the air conditioning system is designed for carrying out a
drying operating mode, in that the supply air conveying unit conveys drying air
for drying the supply air/refrigerant heat exchanger in the air conveying
direction, reversed to the supply air conveying direction leading into the vehicle
interior, past the supply air/refrigerant heat exchanger, whereby the drying
mode is activated at least after shutdown of the vehicle in a previous air
conditioning or reheat mode.

8. (Currently Amended) Air conditioning system for a motor
vehicle, which air conditioning system is designed for an air conditioning
operating mode and ~~at least one other operating mode in the form of~~ at least one
of a heat pump operating mode and a reheat operating mode, said air
conditioning system comprising:

a refrigerant cycle with a compressor, a refrigerant cooler and a
supply air/refrigerant heat exchanger, said supply air/refrigerant heat exchanger
being disposed in a supply air channel and functioning as an evaporator in an air
conditioning operating mode,

a coolant cycle for cooling a heat generating vehicle component,

a refrigerant/coolant heat exchanger, coupling the refrigerant cycle
and the coolant cycle so as to transfer heat, and

refrigerant flow control valves for controlling mode-dependent flow of the refrigerant so as to be guided in an air conditioning mode from the compressor over the refrigerant cooler to the supply air/refrigerant heat exchanger,

wherein said at least one other operating mode includes a reheat operating mode, in which the refrigerant flow control valves guide refrigerant flow from the compressor at least in part to the refrigerant/coolant heat exchanger, functioning as the condenser/gas cooler in this operating mode, and from there to the supply air/refrigerant heat exchanger, functioning as the evaporator in this operating mode, and

wherein the refrigerant/coolant heat exchanger is connected upstream in series on the coolant side to a supply air/coolant heat exchanger disposed in the supply air channel.

9. (Currently Amended) An air conditioning system according to claim 8, wherein said refrigerant flow control valves include:

a 4 four way valve which is connected with a first connection to the compressor output side, with a second connection directly or indirectly to the compressor inlet side and with a third connection to the supply air/refrigerant heat exchanger, and

a 3 three way valve ~~which is connected with~~ having a first connection with a fourth connection of the 4 four way valve, ~~with~~ a second connection to the refrigerant cooler, and ~~with~~ a third connection to the refrigerant/coolant heat exchanger.

10. (Original) Air conditioning system according to claim 8, wherein the refrigerant cycle includes a refrigerant high pressure-sided accumulator with an assigned check valve arrangement operably connecting the accumulator to the supply air/refrigerant heat exchanger, the refrigerant cooler and the refrigerant/coolant heat exchanger.

11. (Original) Air conditioning system according to claim 8, wherein the refrigerant cycle includes:

a refrigerant low pressure-sided accumulator, and

an internal heat exchanger which is arranged on a low pressure side between the accumulator and the compressor and on a high pressure side is connected, on the one hand, to the supply air/refrigerant heat exchanger, and, on the other hand to the refrigerant cooler and the refrigerant/coolant heat exchanger.

12. (Currently Amended) Air conditioning system for a motor vehicle, which air conditioning system is designed for an air conditioning operating mode and ~~at least one other operating mode in the form of~~ at least one of a heat pump operating mode and a reheat operating mode, said air conditioning system comprising:

a refrigerant cycle with a compressor, a refrigerant cooler and a supply air/refrigerant heat exchanger, said supply air/refrigerant heat exchanger

being disposed in a supply air channel of a supply air conveying unit and functioning as an evaporator in an air conditioning operating mode,

wherein the supply air conveying unit exhibits two operating modes with opposite supply air conveying directions, and

wherein the air conditioning system is designed for carrying out a drying operating mode, in that the supply air conveying unit conveys drying air for drying the supply air/refrigerant heat exchanger in the air conveying direction, reversed to the supply air conveying direction leading into the vehicle interior, past the supply air/refrigerant heat exchanger, whereby the drying mode is activated at least after shutdown of the vehicle in a previous air conditioning or reheat mode.

13. (Currently Amended) Air conditioning system according to claim 12, wherein said refrigerant flow control valves include:

a 4 four way valve which is connected with a first connection to the compressor output side, with a second connection directly or indirectly to the compressor inlet side and with a third connection to the supply air/refrigerant heat exchanger, and

a 3 three way valve ~~which is connected with~~ having a first connection with a fourth connection of the 4 four way valve, ~~with~~ a second connection to the refrigerant cooler, and ~~with~~ a third connection to the refrigerant/coolant heat exchanger.

14. (Original) Air conditioning system according to claim 12, wherein the refrigerant cycle includes a refrigerant high pressure-sided accumulator with an assigned check valve arrangement operably connecting the accumulator to the supply air/refrigerant heat exchanger, the refrigerant cooler and the refrigerant/coolant heat exchanger.

15. (Original) Air conditioning system according to claim 12, wherein the refrigerant cycle includes:

a refrigerant low pressure-sided accumulator, and

an internal heat exchanger which is arranged on a low pressure side between the accumulator and the compressor and on a high pressure side is connected, on the one hand, to the supply air/refrigerant heat exchanger, and, on the other hand to the refrigerant cooler and the refrigerant/coolant heat exchanger.

16. (Currently Amended) A method of operating an air conditioning system for a motor vehicle, which air conditioning system is designed for an air conditioning operating mode and ~~at least one other operating mode in the form of~~ at least one of a heat pump operating mode and a reheat operating mode, said air conditioning system comprising:

a refrigerant cycle with a compressor, a refrigerant cooler and a supply air/refrigerant heat exchanger, said supply air/refrigerant heat exchanger being disposed in a supply air channel (12) and functioning as an evaporator in an air conditioning operating mode,

a coolant cycle for cooling a heat generating vehicle component,
a refrigerant/coolant heat exchanger, coupling the refrigerant cycle
and the coolant cycle so as to transfer heat,

refrigerant flow control valves for controlling mode-dependent flow
of the refrigerant so as to be guided in an air conditioning mode from the
compressor over the refrigerant cooler to the supply air/refrigerant heat
exchanger, and

an internal combustion engine exhaust gas/coolant heat exchanger
connected upstream in series to the refrigerant/coolant heat exchanger in the
coolant cycle,

said method including controlling said refrigerant control valves to
switch the air conditioning system between an air conditioning operating mode
and one of the heat pump the at least one other operating mode and the reheat
operating mode.

17. (Currently Amended) A method of operating an air conditioning
system according to claim 16,

wherein said controlling said refrigerant control valve is operable to
switch the air conditioning system between the air conditioning mode and the at
least one other operating mode includes a reheat operating mode, in which the
refrigerant flow control valves guide refrigerant flow from the compressor at
least in part to the refrigerant/coolant heat exchanger, functioning as the
condenser/gas cooler in this reheat operating mode, and from there to the supply

air/refrigerant heat exchanger, functioning as the evaporator in this operating mode, and

wherein the refrigerant/coolant heat exchanger is connected upstream in series on the coolant side to a supply air/coolant heat exchanger disposed in the supply air channel.

18. (Currently Amended) A method of operating an air conditioning system according to claim 16,

wherein a supply air conveying unit for supplying air at the air supply channel exhibits two operating modes with opposite supply air conveying directions, and

wherein the air conditioning system is designed for carrying out a drying operating mode, ~~in that~~ wherein the supply air conveying unit conveys drying air for drying the supply air/refrigerant heat exchanger in the air conveying direction, reversed to the supply air conveying direction leading into the vehicle interior, past the supply air/refrigerant heat exchanger, whereby the drying mode is activated (at least after shutdown of the vehicle when in a ~~previous~~ an air conditioning or reheat mode.

19. (Currently Amended) A method of operating an air conditioning system for a motor vehicle, which air conditioning system is designed for an air conditioning operating mode and ~~at least one other operating mode in the form of~~ at least one of a heat pump operating mode and a reheat operating mode, said air conditioning system comprising:

a refrigerant cycle with a compressor, a refrigerant cooler and a supply air/refrigerant heat exchanger, said supply air/refrigerant heat exchanger being disposed in a supply air channel and functioning as an evaporator in an air conditioning operating mode,

a coolant cycle for cooling a heat generating vehicle component,

a refrigerant/coolant heat exchanger, coupling the refrigerant cycle and the coolant cycle so as to transfer heat, and

refrigerant flow control valves for controlling mode-dependent flow of the refrigerant so as to be guided in an air conditioning mode from the compressor over the refrigerant cooler to the supply air/refrigerant heat exchanger, and

said method including controlling said refrigerant control valves to switch the air conditioning system between an air conditioning operating mode and the at least one other operating mode,

wherein said at least one other operating mode includes a reheat operating mode, in which the refrigerant flow control valves guide refrigerant flow from the compressor at least in part to the refrigerant/coolant heat exchanger, functioning as the condenser/gas cooler in this operating mode, and from there to the supply air/refrigerant heat exchanger, functioning as the evaporator in this operating mode, and

wherein the refrigerant/coolant heat exchanger is connected upstream in series on the coolant side to a supply air/coolant heat exchanger disposed in the supply air channel.

20. (Currently Amended) A method of operating an air conditioning system for a motor vehicle, which air conditioning system is designed for an air conditioning operating mode and ~~at least one other operating mode in the form of~~ at least one of a heat pump operating mode and a reheat operating mode, said air conditioning system comprising:

a refrigerant cycle with a compressor, a refrigerant cooler and a supply air/refrigerant heat exchanger, said supply air/refrigerant heat exchanger being disposed in a supply air channel of a supply air conveying unit and functioning as an evaporator in an air conditioning operating mode,

wherein the supply air conveying unit exhibits two operating modes with opposite supply air conveying directions, and

wherein the air conditioning system is designed for carrying out a drying operating mode, in that the supply air conveying unit conveys drying air for drying the supply air/refrigerant heat exchanger in the air conveying direction, reversed to the supply air conveying direction leading into the vehicle interior, past the supply air/refrigerant heat exchanger, whereby the drying mode is activated at least after shutdown of the vehicle in a previous air conditioning or reheat mode,

said method including switching the supply air conveying direction to and from the drying mode.

IN THE ABSTRACT OF THE DISCLOSURE:

AS An air conditioning system has a refrigerant cycle, a coolant cycle, a refrigerant/coolant heat exchanger, coupling these cycles so as to transfer heat, and a valve for operating mode-dependent control of the refrigerant flow, whereby the air conditioning system can be operated not only in air conditioning mode but also in a heat pump or reheat mode. An internal combustion engine exhaust gas/coolant heat exchanger is connected upstream in series to the refrigerant/coolant heat exchanger in the coolant cycle in the heat pump mode; and/or in the reheat operating mode the refrigerant/coolant heat exchanger functions as a condenser/gas cooler, connected upstream in series on the coolant side to the supply air/coolant heat exchanger. In addition or as an alternative, a drying operating mode can be provided for drying the supply air/refrigerant heat exchanger with reversed air conveying direction.
